

1 CLAIMS

2 We claim:

3 1. An integrated lifting system for a boat cradle which automatically compensates for
4 the changing distance between a fixed support and the surface of a body of water
5 having a fluctuating depth over time wherein the cradle is raised and lowered by motors
6 on the fixed support and the boat is carried by the cradle, said system comprising a
7 level sensing module and a motor control module operatively interconnected, said level
8 sensing module comparing the water line of the boat and the surface of the water, said
9 level sensing module including a control circuit for said motor control module, said
10 control circuit determining the direction of the cradle movement, said motor control
11 module adapted to be connected to the motors whereby said motor control module
12 energizes the motors to move the cradle and said level sensing module signals said
13 motor control module to stop the motors when the water line and the surface of the
14 water reach a predetermined distance.

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16 2. An integrated lifting system for a boat cradle of claim 1 further comprising a receiver
17 module operatively interconnected to said motor control module, said receiver
18 operatively connected to said motor control module, said receiver including manual
19 switches for operating said system.

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21 3. An integrated lifting system for a boat cradle of claim 2 further comprising a
22 transmitter module operatively connected to said receiver, said transmitter being

1 portable and including manual switches for operating said system, said receiver
2 accepting input from said transmitter module manual switches and conveying said input
3 to said motor control module.

4
5 4. An integrated lifting system for a boat cradle of claim 1 further comprising said level
6 sensing module mounted on said cradle in a position related to the water line of the
7 boat and the surface of the water when the boat is floating in the cradle.

8
9 5. An integrated lifting system for a boat cradle of claim 4 further comprising said level
10 sensing module having at least one float switch in said control circuit, said float switch
11 activated by a certain water depth.

12
13 6. An integrated lifting system for a boat cradle of claim 2 further comprising a storage
14 limit switch operatively connected with said motor control module, said storage limit
15 switch adapted to be attached to the fixed support, one of said manual switches
16 commanding a storage circuit, said circuit non-responsive with said storage limit switch
17 closed and the cradle in the storage position, said motor control module signaling the
18 motors to raise the cradle with said storage limit switch open.

19
20 7. An integrated lifting system for a boat cradle of claim 6 further comprising another of
21 said manual switches commanding a launch/retrieve circuit, said circuit non-responsive

1 with the cradle in the launch/retrieve position, otherwise said motor control module
2 signaling the motors to move the cradle to the launch/retrieve position.

3
4 8. An integrated lifting system for a boat cradle of claim 7 further comprising a third
5 manual switch commanding a load/unload circuit, said circuit non-responsive with the
6 cradle in the load/unload position, said motor control module signaling the motors to
7 raise the cradle with the cradle below the load/unload position or to lower the cradle
8 with the cradle above the load/unload position.

9
10 9. An integrated lifting system for a boat cradle of claim 3 further comprising another of
11 said manual switches commanding a launch/retrieve circuit, said circuit non-responsive
12 with the cradle in the launch/retrieve position, otherwise said motor control module
13 signaling the motors to lower the cradle to the launch/retrieve position.

14
15 10. An integrated lifting system for a boat cradle of claim 3 further comprising a third
16 manual switch commanding a load/unload circuit, said circuit non-responsive with the
17 cradle in the load/unload position, said motor control module signaling the motors to
18 raise the cradle with the cradle below the load/unload position or to lower the cradle
19 with the cradle above the load/unload position.

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21 11. An integrated lifting system for a vessel which automatically compensates for the

1 changing distance between a dock and the surface of a body of water having a
2 fluctuating depth over time comprising a fixed support, at least one motor mounted on
3 said fixed support, a cradle movably connected to said at least one motor, said cradle
4 adapted to lift and lower a vessel, a motor control module mounted on said fixed
5 support and operatively interconnected to said at least one motor, a level sensing
6 module operatively connected to said motor control module, said level sensing module
7 comparing the water line of the vessel and the surface of the water, said level sensing
8 module including a control circuit for said motor control module, said control circuit
9 determining the direction of said cradle movement whereby said motor control module
10 energizes said at least one motor to raise or lower the cradle and said level sensing
11 module signals said motor control module to stop said at least one motor when the
12 water line of the vessel and the surface of the water reach predetermined distance.

13
14 12. An integrated lifting system for a vessel of claim 11 further comprising said cradle
15 adapted to be immersed in water below the water line of the vessel, said cradle means
16 adapted to capture a floating vessel, said control module controlling power to said at
17 least one motor, said level sensing module mounted on said cradle at a position
18 approximately parallel with the water line of said vessel.

19
20 13. A lifting system of claim 12 further comprising said cradle adapted to suspend a
21 vessel water line above the surface of the water, said level sensing module including at
22 least one float switch whereby said control module stops said power when said cradle a
23 descends below the surface of the water activating a float switch.

1 14. A lifting system of claim 11 further comprising at least one safety switch operatively
2 connected to said motor control module, when activated said safety switch energizes
3 said motor control module to not accept signals from the level sensing module and
4 disengage said motor.

5
6 15. A lifting system of claim 14 further comprising said at least one safety switch is a
7 Mercury type switch.

8
9 16. A method of automatically positioning a vessel lift cradle at the proper depth in a
10 body of water with changing depths comprising

11 a) providing a stationary support in the water with a vertically movable cradle for lifting a
12 vessel out of the water and lowering a vessel into the water, said stationary support
13 having a storage limit switch;

14 b) providing a power source connected to said cradle for moving said cradle;

15 c) providing a control module with a connection to said power source and a level
16 sensing module, said control module having three states, storage, load/unload and
17 launch/retrieve, said storage state placing said cradle at a limit above the water, said
18 launch/retrieve state placing said cradle in the water at a level determined by said level
19 sensing module and said load/unload state being an intermediate position determined
20 by said level sensing module;

21 d) providing said level sensing module on said cradle referenced to the waterline of said

1 vessel floating in said cradle, said level sensing module having at least one float switch
2 tied into said connection between said control module and said power source;

3 e) providing a receiver module operatively connected with said level sensing module,
4 said receiver module having command buttons for said storage state , said load/unload
5 state and said launch/retrieve state;

6 f) providing a control circuit interconnecting said storage limit switch, said level sensing
7 module, said control module and said receiver module, said control module
8 determining the direction of said power source, said control module starting and
9 stopping said power source;

10 g) operating said storage button and said control circuit sending a signal to said power
11 source to raise said cradle when said limit switch is open;

12 h) said power source raising said cradle above the water until said limit switch is tripped
13 and said control circuit stops said power source.

14
15 17. A method of automatically positioning a vessel lift cradle of claim 16 further
16 comprising

17 a) operating said launch/retrieve button and said control circuit sending a signal to said
18 power source to move the cradle to the launch/retrieve position when said cradle is not
19 in said launch/retrieve position;

20 b) said power source moving said cradle until said level sensing module is in the
21 launch/retrieve position and said control circuit stops said power source.

1 18. A method of automatically positioning a vessel lift cradle of claim 17 further
2 comprising

3 a) operating said load/unload button and said control circuit sending a signal to said
4 power source to raise said cradle when said cradle is below in said load/unload
5 position, said load/unload position determined by said level sensing module;

6 b) said power source raising said cradle until said level sensing module is in said
7 load/unload position and said control circuit stops said power source; or

8 c) sending a signal to said power source to lower said cradle when said cradle is above
9 said load/unload position;

10 d) said power source moving said cradle until said level sensing module is in said
11 load/unload position and said control circuit stops said power source.

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13 19. A method of automatically positioning a vessel lift cradle of claim 16 further
14 comprising

15 a) providing a portable transmitter module, said transmitter module having command
16 buttons for said storage state, said load/unload state and said launch/retrieve state,
17 said transmitter operatively connected to said receiver;

18 b) operating said transmitter buttons to remotely energize, respectively, said buttons of
19 said receiver.

1 20. A method of automatically positioning a vessel lift cradle of claim 16 further
2 comprising
3 a) providing an independent safety circuit including at least one safety switch
4 operatively connected to said control module;
5 b) determining said cradle has exceeded said storage state or said launch/retrieve
6 state;
7 c) energizing said at least one safety switch to signal said control module to disregard
8 signals from said level sensing module and disconnect from said power source to
9 prevent damage to said vessel.